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New Study Recommends Test for Injured Athletes to Accurately and Safely Measure Aerobic Fitness

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NEW STUDY RECOMMENDS TEST FOR INJURED ATHLETES TO ACCURATELY AND SAFELY MEASURE AEROBIC FITNESS

DAYTON, Ohio — Athletes who get injured and can't run, but need to have physical fitness assessments done, can now take a test that will accurately measure their aerobic fitness without the threat of aggravating their injuries, says a health and sport science expert.

A sedentary lifestyle during rehabilitation is a serious threat to an athlete's cardiovascular system, says Paul M. Vanderburgh, associate professor of health and sport science at the University of Dayton and the principal author of a study on a new test for aerobic fitness being published in the February issue of the *Journal of Strength and Conditioning Research*. "Maintaining an exercise regimen along with periodically assessing aerobic exercise tolerance are important for endurance sport athletes during long-term recovery," he says.

Vanderburgh and a team of associates were commissioned by the U.S. West Point Military Academy to conduct the study, "The 10-minute Cycle Ergometer Test: A Body Mass Adjusted Test of Maximal Aerobic Power," on physically active college-age men and women. The study developed a new fitness test that offers injured athletes an alternative to older, less accurate and more risky tests used to measure their aerobic fitness.

The test consists of pedaling a stationary bike as hard as possible for 10 minutes, allowing people to pace themselves or change speed as they desire. Their total work is recorded on the bike's instrument panel and is the key measurement used to calculate cardiovascular fitness. This test replaces the more traditional running tests for athletes who can't tolerate the high joint stress of walking, running or high-resistance pedaling of other bicycle tests.

Unlike most standard belt-resistance bikes used on older tests, this test uses a fan-driven bike, which accommodates a much broader range of body sizes and fitness levels while providing a lower torque or less resistance against pedaling.

"Normally, athletes who need to have physical fitness assessments done would have to run on a treadmill," Vanderburgh explains. "For most athletes that get injured, low-torque cycling can be done much sooner in their recovery than high-impact running or even the traditional high-resistance cycling. Our work shows this test to be much more accurate than low-intensity bike tests that are based on heart rate at a very low intensity."

"Here's a test where the resistance stays low but the exertion gets very high because the athletes are pedaling fast," he says.

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For instance, an athlete who has knee reconstruction probably wouldn't be running for a year, says Vanderburgh, but would be capable of low-torque, high heart-rate cycling in as little as three months.

"That's the beauty of the test," he says. "The 10-minute bike test is just as physically demanding as the two-mile run test. You're tapping out your cardiovascular system. That's what's important in a good test. We want to push you to your physiological limits, but we don't want to hurt you or upset your rehab," he says.

The other factor that sets this test apart from older tests is that it correctly adjusts for body size. Older aerobic fitness tests favored smaller athletes. This test comes with a table, spelling out what athletes of various weights need to do to achieve a certain maximal oxygen uptake.

"This test correctly adjusts for body weight,' Vanderburgh says. "We found out what the influence of body mass really was, and we leveled the playing field so people of all different sizes could take the test. This way individuals are evaluated on their cardiovascular fitness levels only — not their sizes."

According to Vanderburgh and his research team, the results of the study are good news for military institutions and for any injured athlete who needs a very accurate but low-risk assessment of cardiovascular fitness.

"At West Point, the stakes are very high" for military cadets, explains Vanderburgh, a West Point graduate, a 10-year Army infantry veteran and a former instructor at the academy. "Fitness testing grades are part of your academics in a military academy. They help determine your grade point average, and that determines your class rank. Class rank dictates where you're going to go for your assignment when you graduate. This is not a pass-fail test. Military academy cadets need a precise grade."

Over the course of a year, Vanderburgh estimates about 8 percent of the West Point cadet population experience an injury or condition that prevent them from running.

While the test appears to be promising for college and high school athletes, Vanderburgh says the test is not recommended for the general population and especially for at-risk populations such as older adults, people who are more sedentary or people who might be at risk for a heart attack.

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